Permit Fact Sheet

General Information

Permit Number:	WI-0029602-11-0	
Permittee Name:	MERCER SANITARY DISTRICT NO. 1	
Address:	5054 N US Highway 51	
City/State/Zip:	MERCER WI 54547	
Discharge Location:	4651 N. Fierick Road, Mercer	
Receiving Water:	The groundwater of the Flambeau Flowage Watershed within the Upper Chippewa Drainage Basin in Iron County	
Design Flow(s)	Daily Maximum	0.0987 MGD
	Annual Average	0.0827 MGD
Significant Industrial Loading?	No	
Operator at Proper Grade?	Yes	
Approved Pretreatment Program?	N/A	

Facility Description

Mercer Sanitary District No.1 owns and operates a domestic wastewater treatment system. The plant designed to treat 82,700 gallons per day, currently treats an average of 41,000 gallons per day (2017 – 2021). The system consists of screening and grit removal and sequencing batch reactors, followed by seepage cells. In the batch reactors (a type of activated sludge treatment), naturally-occurring bacteria and organisms already in the wastewater break down organic matter in the waste stream. The treated water is discharged to the seepage cells, where it is further filtered by the sandy soil in the bottom of the cells as it percolates through the soil eventually reaching the groundwater. There are three groundwater monitoring wells in the vicinity of the system. Groundwater samples are taken from them quarterly to determine if the discharge is having any localized impact on groundwater quality. Solids generated during treatment (sludge) are given further treatment in an aerobic digester and then landspread as a soil conditioner on Department approved cropland.

Substantial Compliance Determination

Enforcement During Last Permit: The facility currently has an active/open Enforcement Case related to repeated violations of total nitrogen effluent limits, noncompliance reporting requirements, and Compliance Maintenance Annual Report (CMAR) response requirements. An Enforcement Conference was held on November 23rd, 2021 during which these violations were discussed. The district has since submitted a commitment to return to compliance. There have been several violations of effluent limits and missed reporting. However, the facility has taken the necessary steps to correct their actions and will continue to work
with the department on returning to compliance.

After a desktop review of all Notice of Violation/ Enforcement Case (NOV/EC) requirements, discharge monitoring reports, CMARs, and land app reports, the district has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable)**
701	INFLUENT Average of 0.041 MGD (2017-2021 data)	Representative samples shall be taken in the influent channel ahead of grit removal.
001	EFFLUENT Average of 0.041 MGD (2017-2021 data)	Representative samples shall be taken from the sequencing batch reactor effluent pipe leading to the seepage cells
002	SLUDGE Average of 6 US tons/year (Information listed in application)	Representative samples shall be taken of the aerobically digested sludge which is held in a storage tank until full.

Sample Point Designation For Groundwater Monitoring Systems		
Sample Pt Number	**Well Name**	**Comments**
802	802 (MW-2A)	Side gradient well (Located less than 100 feet West of seepage cell #1)
805	805 (MW-5)	Down gradient well (Located less than 100 feet South of seepage cell #2)
806	806 (MW-6)	Down gradient well (Located less than 100 feet South of seepage cell #3)
808	808 (MW-8)	**To be installed during the permit term.** Upgradient background well used to calculate Preventative Action Limits (PALs). See "Schedules" for more information.

1 Influent - Monitoring

Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Total Organic N =

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Total Kjeldahl Nitrogen - Ammonia Nitrogen

Changes from Previous Permit:

No changes were required in this permit section. Sampling requirements and frequencies are the same as the previous permit.

Explanation of Limits and Monitoring Requirements

Influent monitoring is needed to assess loading to the facility and treatment performance. The required parameters and sampling frequency are appropriate for a land treatment system (ch NR 206, Wis. Adm. Code).

2 Land Treatment – Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	50 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field		su	Weekly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Total Organic N = Total Kjeldahl Nitrogen - Ammonia Nitrogen
Solids, Total Dissolved		mg/L	Monthly	24-Hr Flow Prop Comp	
Chloride	Monthly Avg	250 mg/L	Monthly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Total	Monthly Avg	10 mg/L	Monthly	Calculated	Total N = Total Kjeldahl Nitrogen + (Nitrite + Nitrate) Nitrogen

Changes from Previous Permit:

No changes were required in this permit section. Sampling requirements and frequencies are the same as the previous permit.

Explanation of Limits and Monitoring Requirements

All requirements for land treatment of municipal wastewater are determined in accordance with NR 206 Wis. Adm. Code. All categorical limits are based on NR 206.08(1) Adm. Code. More information can be found in the "Mercer Sanitary District No 1 – Land Disposal System Evaluation Report – WPDES Permit # WI-0029602" memo dated January 3, 2022.

BOD_5, chloride and **total nitrogen** – Limitations are consistent with facilities approved or modified post January 1, 1990 (NR 206.05 Wis. Adm. Code).

Sampling Frequency - The "Monitoring Frequencies for Individual Wastewater Permits" guidance document (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

Permitted monitoring frequencies fall below the standard monitoring frequencies outlined in the guidance document. Section NR 205.066(1) Wis. Adm. Code allows sampling frequency to be set on a case-by-case basis. The current sampling frequency has been in place for many years. The permittee demonstrates a history of consistent compliance with existing permit limits. Data submitted during the previous permit term continues to show consistent compliance with permit limitations, and the set monitoring frequencies are consistent with requirements of state code. The current monitoring frequencies shall continue this permit term.

3 Groundwater – Monitoring and Limitations

3.1 Groundwater Monitoring System for Seepage cell monitoring system

Location of Monitoring system: Adjacent to seepage cells

Wells to be Monitored: 802 (MW-2A), 805 (MW-5), 806 (MW-6)

Well Used To Calculate PALs: PALs were not calculated this permit term. Well 802 has been used in the past to calculate PALs, but it was determined that because of erratic groundwater flow the well is actually side gradient. A new upgradient well is needed and a schedule to install a new well (to be identified as 808) has been included in this permit reissuance. See the "Schedule" section for more information.

Point of Standards Application Well(s): There are no POSA wells.

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet MSL	*****	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	2.0	10	Quarterly
Chloride Dissolved	mg/L	125	250	Quarterly
Solids, Total Dissolved	mg/L	410	N/A	Quarterly
pH Field	su	6.9	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.1	N/A	Quarterly
Nitrogen, Total Kjeldahl Dissolved	mg/L	*****	N/A	Quarterly

Changes from Previous Permit:

- The Preventative Action Limit (PAL) and Enforcement Standard for Ammonia was updated to meet ch NR 140 Wis. Adm. Code.
- The parameters dissolved alkalinity and total hardness monitoring has been removed this permit term.
- Installation of a new upgradient background well (808) is required.

Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch NR 140 Wis. Adm. Code. Indicator parameter PAL values are established per s NR 140.20 Wis. Adm. Code. For more information, please refer to the "Mercer Sanitary District No 1 – Land Disposal System Evaluation Report – WPDES Permit # WI-0029602" memo dated January 3, 2022.

The PALs and Enforcement Standard (ES) limits will remain the same except for the PALs for two parameters, pH and Total Dissolved Solids per s NR 140.20 Wis. Adm. Code.

Parameter	Current Permit		Proposed Permit	
	Preventive Action Limit	Enforcement Standard	Preventive Action Limit	Enforcement Standard
Nitrogen, Ammonia Dissolved	2.0 mg/L	N/A	0.97 mg/L	9.7 mg/L

Background PAL Well – PALs were not calculated this permit term. Well 802 has been used in the past to calculate PALs, but it was determined that because of erratic groundwater flow the well is actually side gradient. A new upgradient well is needed and a schedule to install a new well (to be identified as 808) has been included in this permit reissuance. See the "Schedule" section for more information. Once installed monthly samples are required for three months, followed by quarterly sampling through the rest of the permit term. The permittee shall notify the department after well installation so the correct forms can be generated.

Total Dissolved Ammonia - The PAL and ES limits for Ammonia have been changed to 0.97 mg/L and 9.7 mg/L respectively, reflecting the change in ch NR 140 Wis. Adm. Code.

Total Alkalinity as CaCO3 and **Total Hardness as CaCO3** – Information provided by the parameters are no longer needed by the department to determine groundwater compliance.

4 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform and Aerobic Digestion	Incorporation	Land Application	6 dry tons/ year
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, during the most recent round of sampling (2020), the sample was below the level of detection. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

Sample Point Number: 002- Sludge from storage tank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	

Changes from Previous Permit:

- PCB monitoring is required during the 2024 calendar year.
- Water extractable phosphorus has been added this permit term.

Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Sampling for PCBs is required once during the 2024 calendar year.

PCB – Monitoring was not required last permit term because all sample data was below the limit of detection. Samples are required this term to determine if trends of very low levels continue.

Water extractable phosphorus (WEP) – WEP has been added to this permit term. It is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

5 Schedules

5.1 Total Nitrogen Operation and Needs Review

Required Action	Due Date
Operation and Needs Review: The permittee shall prepare and submit to the Department for approval an operation and needs review. The review shall include an evaluation of collected effluent data demonstrating if Total Nitrogen limits are being met over a minimum of the previous 12 months. If limits are not consistently met, the review should also contain possible source reduction measures, operational improvements or other minor facility modifications that will optimize nitrogen treatment and enable compliance with the nitrogen limit. The review shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than July 1, 2023. The review shall also state whether the measures, improvements, and modifications will enable compliance with final Total Nitrogen limits.	03/31/2023
Implement Operational Changes: The permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operation and needs review. If the operation and needs review concludes that the facility can comply with Total Nitrogen limits using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the permittee shall implement these changes per the plan and schedule and is not required to comply with the Study of Feasible Alternatives milestone below.	07/01/2023
Study of Feasible Alternatives: If the Operation and Needs Review concludes that the permittee cannot comply with Total Nitrogen limits through source reduction measures, operational improvements and other minor facility modifications, the permittee shall initiate a study of feasible alternatives for meeting Total Nitrogen limits. This study shall include a proposed plan and schedule for any construction or upgrades required to meet the Total Nitrogen limits. The Department may reopen and modify the permit to include an implementation schedule for these subsequent steps, if needed.	10/01/2023

5.2 Groundwater Monitoring Well - Installation

Required Action	Due Date
Plans and Specifications: Submit plans and specifications for installation of an upgradient monitoring well.	09/30/2022
Installation: Complete well installation in accordance with ch NR 141, Wisconsin Administrative Code. (Note: Documentation of well construction must be submitted to the Department within 60 days of well installation.)	09/30/2023
Groundwater Monitoring Well Site Map Submittal: Submit a site map in accordance with s. NR 141.065, Wis. Adm. Code. This site map must include a scale bar and directional arrow and accurately show site structures, property boundaries, nearby surface water and water supply wells and all site groundwater monitoring wells.	12/31/2023

5.3 Land Treatment Management Plan

A management plan is required for the land treatment system.

Required Action	Due Date
Land Treatment Management Plan Submittal: Submit an update to the management plan to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	06/30/2024

Explanation of Compliance Schedules

Total Nitrogen Operation and Needs Review – There has been some issues with meeting Total Nitrogen limitations. The permittee is required to investigate if problems are continuing and efforts that can be made at the facility to correct the problem without a large facility upgrade.

Groundwater Monitoring Well - Installation - To accurately determine background concentrations of pollutants a new background well is required.

Land Treatment Management Plan – Since the last management plan update (June 2018) there has been the discovery the direction of groundwater flows is erratic, and a new background well is needed. The updated plan is required after the installation of the new background well.

Attachments:

Water Flow Schematic(s)

"Mercer Sanitary District No 1 – Land Disposal System Evaluation Report – WPDES Permit # WI-0029602" memo dated January 3, 2022.

Proposed Expiration Date:

March 31, 2027

Justification of Any Waivers From Permit Application Requirements

N/A

Prepared By:

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Date: January 20, 2022

cc: Monica Begley, WDNR - Rhinelander